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Implementation of Urban Corridors will Ease Environmental Impacts between Residential and Industrial Zones

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Graduate Thesis: Implementation of Urban Corridors will Ease Environmental Impacts between Residential and Industrial Zones

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IMPLEMENTATION OF URBAN CORRIDORS WILL EASE ENVIROMENTAL IMPACTS BEWTEEN RESIDENTIAL AND INDUSTRIAL ZONES

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Abstract

The objective of this work was to investigate the environmental conditions or patterns that impact cities and urban landscapes and to identify the reasonable buffers or corridors that can ease these impacts, primarily between industrial and residential areas. The hypothesis is that urban cities do face environmental impacts from various sources, a primary source being industrial practices, and that the implementation of corridors or buffers will minimize these impacts and possibly improve the environmental and socioeconomic conditions of the surrounding residential areas and the cities as a whole. The research included defining the structure of urban areas, investigating environmental impacts that affect urban areas, investigating various corridor or buffer options, and determining how the findings relate to a case study. The city of Mansfield, Ohio was used as a case study to test the hypothesis and research. The following results were established: 1) the city of Mansfield follows the structure or pattern of typical urban cities; 2) the city of Mansfield is experiencing economic instability and population shifts; 3) the city of Mansfield faces a small number of environmental issues that pose major risks; and 4) industrial practices do not significantly impact adjacent residential zones. It has been concluded that the implementation of urban corridors or buffers are not feasible for the city of Mansfield as a whole because there is little risk of environmental impacts affecting residential and non-residential areas alike. However, some locations may need to consider solutions for noise impacts on neighboring areas. The implementation of corridors or buffers in other urban locations will have to be discussed and planned by key stakeholders to determine their viability.

Key Words: Urban (or Built-Up Land); Urban Structuring; Residential Areas/Zones; Industrial Areas/Zones; Commercial Areas/Zones; Transportation, Communications, and Utilities; Industrial and Commercial Complexes; Mixed Urban Areas; Blight; Dereliction; Burgess Model; Hoyt Model; Physical Obsolescence; Functional Obsolescence; Land-Use; Land-Use Planning; Greenway

Chapter 1: Introduction

1.1- Topic

The face of many of today's urban areas may be different from the hustling and bustling epicenters of years past. Cities offered more economic opportunities and provided residents with vibrant and diverse neighborhoods (though the evidence of blighted areas was very visible). While many urban areas play host to industrial and commercial businesses and hold the weight of significant population numbers, the quality of the surrounding environment has diminished by certain degrees. The problem, or the effect thereof, does not lie solely in the general atmosphere of the urban area, for it should be reasonable to expect that such locations would experience increased levels of air pollution, noise, traffic, and so forth. However, the acceptance of these industry-related occurrences has not only affected the urban area in general, but has mainly impacted the residential areas and its citizens. Some, if not many, urban residential areas are experiencing the brunt of environmental impacts, especially those located near or adjacent to industrially or commercially zoned areas. The objective of this thesis paper is to investigate the environmental conditions or patterns that plague cities and urban landscapes, and to identify the reasonable (or minimal) environmental buffers that can ease impacts between industrial and residential uses in urban areas.

There are many segments of urban areas where residential uses are coming into conflict with neighboring industrial zones, a battle that has been brewing for years. There has been a general shift in suburbanization that has resulted in some industries relocating to areas outside of the cities, thus leaving a problematic situation within the vicinities of residential zones (Reuniting Man and Nature). There have been instances of industrial businesses moving into these vacated sites possibly as a result of less expensive land value and competition for scarce

space. The two scenarios have caused some problems with the remaining neighboring residents, whose concerns cross the board of visual impacts, increased transportation activities (depending on whether light or heavy manufacturing processes are taking place), possible abandoned and vacant industrial sites, and other exposure issues.

Concern not only arises from residential zones. Many of the industries are perplexed by the scrutiny generated by their neighbors. The industries have to contend with minimizing or addressing the public complaints, as well as meeting the requirements (i.e., regulatory permits) to control the kinds and amounts of pollutants discharged or the general impacts made on the surrounding communities (Land Use Conflicts).

In order to create an alliance or civil existence, there needs to be a means to allow each zone to thrive productively without infringing upon the opportunities of the other. An option that will be investigated in this research is the development of industrial buffers to minimize the impact of uses within the industrial and residential zones as a means to easing long-standing conflict, as well as bringing economic viability back to segment of urban areas.

1.2- Research Questions

These are questions that were investigated in this research:

- What environmental conditions affect cities/urban areas?
- What are the criteria for a reasonable (or minimal) environmental buffer between industrial and residential uses in cities/urban areas?
- What are the practices or uses within industrial and residential areas that pose environmental problems?
- What land uses are most acceptable for industrial buffers?

- How might the establishment of industrial buffers impact the economic viability of the area and its surroundings?
- What other impacts will the industrial buffers have:
  - On transportation?
  - On the environment? (is there potential for creating a new nuisance to the environment?)

- How can this be implemented in model site (Mansfield, Ohio)?
  - Where are there opportunities?
  - What are the obstacles?

The primary areas of concern that were investigated and considered were physical impacts to the environmental media of air, water, and soil. Given the hypothesis that industrial practices would impact surrounding residential areas, the initial view was that significant environmental problems would consist mainly of physical impacts affecting the resident's quality of life (i.e., hazardous material discharges to soil and groundwater, oil spills in local waterways, and pollutant air emissions). Upon further research and observation (specifically when investigating the city of Mansfield), it was realized that the impacts extended beyond the initial considerations and included the issues of neighborhood aesthetics and noise (i.e., industrial landscapes and production- and traffic-related noise) . However, due to project brevity, the issues of aesthetics and noise were only discussed in the results and final analysis and conclusions.

1.3- Definitions

Listed are terms that may be referenced within the paper and are defined here to provide a better understanding of the topic at hand:

Urban (or Built-up Land): areas of intensive use with much of the land covered by structures (Urban or Built-up Land).

Urban Structuring: the integration of dominant land uses (such as residential uses, business centers, airports etc) with movement networks. Urban structuring is also about the intensity of various uses at different locations (Urban or Built-up Land).

Residential Areas: land designated for living purposes. Examples include single units, twinsingles, duplexes, and apartment complexes (Urban or Built-up Land).

Commercial Areas: land designated for the primary use of selling products and services. Examples include retail shopping centers, commercial shop developments, junkyards, and resorts (Urban or Built-up Land).

Industrial Areas: land designated for manufacturing purposes (ranging from light to heavy manufacturing) (Urban or Built-up Land).

Transportation, Communications, and Utilities: industries which comprise mostly all land-use categories. Examples include highways, railways, ports, electric entities, gas entities, water entities, and wastewater entities (Urban or Built-up Land).

Industrial and Commercial Complexes: those industrial and commercial businesses that occur together or are in close proximity (Urban or Built-up Land).

Mixed Urban Areas: industrial uses cannot be separated on mapping scales. There is an intermixture of more than one land use (Urban or Built-up Land).

Blight: abandoned houses, factories, and businesses; occupied buildings in poor or dangerous conditions; inadequate street lighting; streets, roads, and sidewalks in need of repair; open ditches, litter, or trash in streets and vacant lots (Greenberg 22).

Industrial Buffer: an area that provides an appropriate transition between industrial areas and adjacent residential zones, or commercial zones having a residential orientation and/or pedestrian character (Seattle's Industrial Zones).

Environmental Hazard: anything outside an individual that can cause adverse health effects or damage the environment (Greenberg 3).

Chapter 2: Background

Finding suitable solutions for environmental problems affecting cities and urban areas will have a major impact on urban residents most prone to these issues, and the industries and businesses established in the areas.

Besides the economic and social problems facing them, poor and low income residents in urban areas are at a disadvantage when it comes to the environmental conditions of their neighborhoods. Listed are various remarks on the issues:

- Janice E. Perlman, President of The Mega-Cities Project and professor of Comparative Urban Studies at Trinity College, stated that "poor citizens face the worst environmental consequences". She comments that their neighborhood public services (i.e., water, sewage, drainage, and garbage collection) are oftentimes poor or non-existent (Global Issues, Green Cities)
- The Urban Environment Thematic Group (part of The World Bank Group) describes that low income residents are most vulnerable to exposures of environmental degradation and may be least able to deal with the consequences. They oftentimes cannot afford the accommodations to protect themselves from environmental risks, have the least resources to deal with related illness and

injuries, and have the least political power to address the concerns (Environmental Strategies for Cities)

- According to the World Development Report, "the main sufferers from environmental degradation are often the poor" (Cairncross 13)

This is not to say that poor and low income urban residents are the only recipients of environmental obstacles. However, they represent the extreme cases that may benefit the most from cleaner development and the implementation of urban buffers or corridors to minimize impacts from industrial practices.

In addition to these groups, many other urban residents feel disconnected from the environment due to conditions in their own immediate surroundings and the inaccessibility to other natural environments. A desire is that urban corridors, parks, and open spaces will help ease these concerns, as well as increase the health of the communities, reduce crime, increase educational performance, boost property values, improve air quality, create urban wildlife habitat, reduce stormwater runoff, and cool the temperatures of heat islands in cities.

Chapter 3: Literature Review

3.1- Background Literature

To address the concerns of environmental degradation or impact on the urban citizen and his or her immediate surroundings (as well as attempt to provide a feasible solution), there should be a review of the socioeconomic issues affecting cities and urban areas (which has a bearing on resulting environmental problems).

Structure of Urban Areas

First and foremost, a basic definition of an urban environment is "an interaction of the natural environment, the built environment, and the socio-economic environment" (Cities and the Environment 32), and it consists of resources, processes, and effects. In this definition, a natural environment is related to flora, fauna, human beings, water, and other environmental media. The built environment consists of buildings, housing, roads, water supplies, and other facilities and public amenities. Lastly, socioeconomic environments deal with human activities, educational systems, culture, heritage, business activities, and so forth. These entities combined help make up the densely populated centers that have become the nuclei for industrial activities, trade, recreation, and living on a broad scale.

The make-up of urban areas is the first step in addressing the conflict that arises between different zones. The following Burgess Model ("Urban Land Use Patterns: MEDCs") outlines the general zoning of urban areas (five categories total):

Zone 1: The Central Business District (CBD) consisting of various businesses (i.e., shops, offices, and entertainment facilities).

Zone 2: Inner City Area (or Twilight Zone) consists primarily of older housing and light manufacturing industries (the model researched, Barcelona, Spain, had structures dating to the Industrial Revolution).

Zone 3: Low Class Residential consisting of poor quality housing (an improvement from Zone 2).

Zone 4: Medium Class Residential consisting of semidetached housing and council estates.

Zone 5: High Class Residential (or Commuter Zone) consisting of expensive housing on the outskirts of the city or by near countrysides.

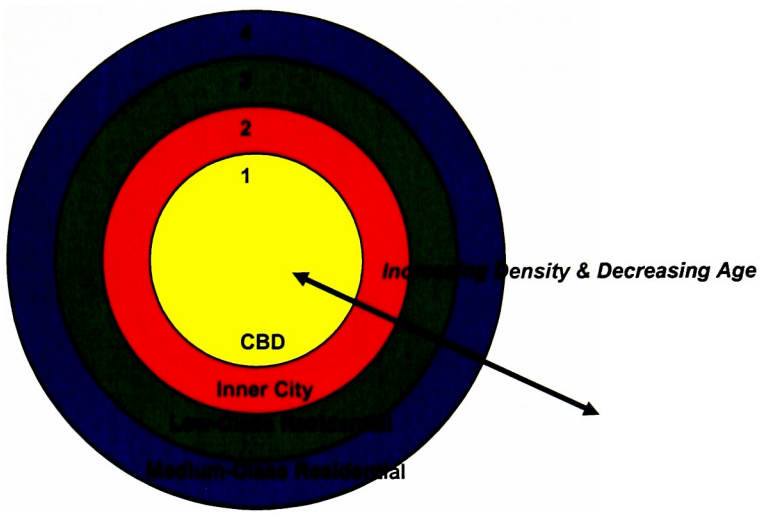

Figure 3.1: Burgess Model

A common pattern between these zones is that as you move further away from the central CBD, there is a decline or decrease in the age of the structures and the density of the population.

Another visual that exemplifies a difference in urban zoning is the Hoyt Model ("Urban Land Use Patterns: MEDCs"). This model shows how low class residential areas are more prone to exist near industrial zones, a large reason due to commuter costs (this concept is called the "Attraction of Competing Land Use"). In contrast, high class residential areas locate way from the central business centers and develop in less congested locations (this concept is called the "Repulsion of Competing Land Uses").

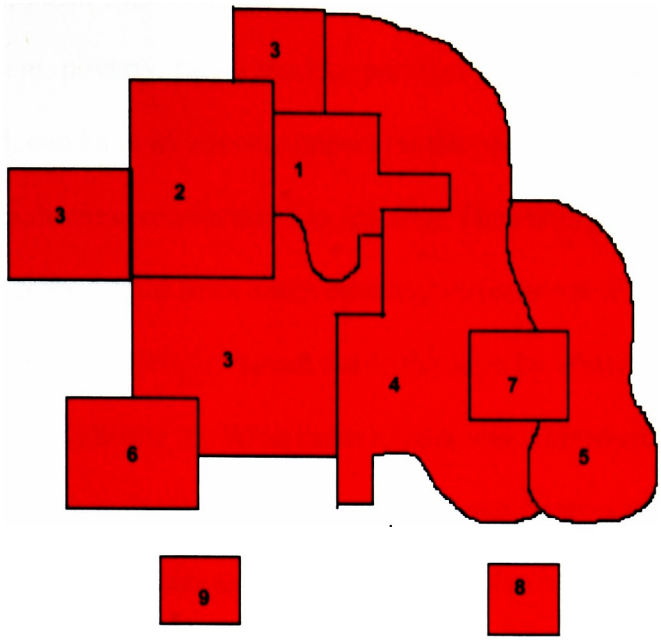

Figure 3.2: Hoyt Model

The Hoyt Model contends that there are three explanations for these patterns. First, there is a historical conception that urban areas expand from its original industrial sites, thus the general shift to areas away from the CBD. Second, there is an economic connation that areas or facilities closer to the CBD have become more expensive, thus encouraging many businesses and residents to move to less expensive areas outside of the urban centers. Third and lastly, there is the idea of "Concentration of Similar Land Uses", where it is more desirable for industries to exist in common locations (typically urban areas), while residential areas would locate outside of those areas.

Cities and urban areas have had a lengthy impact on the natural environment throughout the years, from mining resources for industrial processes to polluting pubic waterways with industrial discharges and residential waste. Urban residents have increased the size and activity of the urban area for centuries, especially since the influential time of the Industrial Revolution (White 27). Such growth has inevitably brought about problems of poor air quality, contaminated

water supplies, congestion, and sewage disposal issues. In addition, there is a rise in employment, poverty, racial tension, political unrest, and personal hardships. These issues, if not addressed, can have an adverse impact on the surrounding environment, especially the businesses, homes, and facilities in the area. The result (primarily during the second half of the twentieth century) has been a movement of citizens out of the urban centers. Hence, the trend has been "richer urban people moved out to the suburbs where they left the central city, bereft of wealth, to rot" (White 5). What came to pass was a physical blight of structures due to various situations, such as the operation of neglected and improperly maintained housing units for cost saving reasons by landlords and owners, as well as technological changes that no longer called for traditional industries (i.e., manufacturing and warehousing) to exist as abundantly in urban areas. This, too, ultimately led to lost jobs and unemployment and contaminated soils and infrastructure. The book Urban Environmental Management: Environmental Change and Urban Design summed it up as "...physical blight is a function of a social blight, which is usually a long-term problem, not amendable to quick fixes..." (p. 69). What many cities and urban areas now face is the issue of dereliction.

Concept of Dereliction

As one book, Derelict Landscapes, puts it, "decline begins in landscapes when structures built to contain efficiently and symbolize prescribed functions, prove less efficient" (p. 6). So begins the idea of urban dereliction.

For many of the facilities and remaining industrial buildings in cities and urban centers, operating costs become the first burden leading to dereliction. Despite land value or surrounding economic opportunities, operating costs (which include interest payments, energy costs, taxes

and labor costs) are pretty much fixed (Jackle and Wilson 6). In order to generate a small profit over time, sometimes owners would neglect the non-fixed costs of maintenance (a self-inflicted form of disinvestment). As the practices increased and the structures became less utilized, buildings became vacant and created opportunities for intrusion, theft, vandalism, and arson (Jackle and Wilson 7). Ultimately, these structures become prevalent, influencing other forms of devalue and disinvestment, thus producing "derelict zones".

Dereliction is composed of two functions: physical obsolescence and functional obsolescence. Physical obsolescence relates to the degradation of structures and facilities that are far beyond repair and replacement (Jackle and Wilson 19). This can be internally motivated by decreased government funding, bankrupt businesses, or advanced wear-and-tear. On the other hand, functional obsolescence is a result of external innovations that produce a higher level of competition elsewhere and make existing technologies less influential (Jackle and Wilson 19). Functional obsolescence becomes the most detrimental because it involves decreased investment opportunities, which further diminishes economic viability for nearby industries, residences, and overall regions.

The oldest economic centers of cities and urban areas seem to be the most prone to dereliction. According to Derelict Landscapes, "nowhere is dereliction more vivid than in old industrial areas ... where underutilized and abandoned buildings stand as somber reminders of past prosperity now elusive" (p. 57). During the 1960s and 1970s, these hardest hit areas (the "manufacturing belts" of the Northeast and Midwest- lumber mills, automotive facilities, and steel mills) began to see multiple plant closings, a result of moving to different regions for newer needs and opportunities (Jackle and Wilson 68-69).

What this industrial dereliction ultimately caused were expensive social costs that would be born not by the fleeing business owners nor investors, but the surrounding communities (Jackle and Wilson 78). This leads to four conditions:

- "Infrastructural costs are shifted from entrepreneur to community": the upkeep of facilities and remaining structures fall on local tax payers.
- "Social costs are transferred from rich to poor": remaining, oftentimes poorer, residents are left to deal with decreasing economic opportunities and resources.
- "Social costs are transferred from present to future": unless change occurs, future generations will inherit the degraded landscapes, poverty, decay, and social & economic burdens.
- "Social costs are transferred geographically": while outside regions become more economically viable with increased capital and resource concentration, the disinvested areas continue to erode and become poorer.

The remaining community is left to contend with the dereliction, which will soon include environmental impacts that cause concerns for other problems.

Environmental Issues of Urban Areas

Though dereliction is not a direct predecessor to environmental problems, the two concepts do encourage other another.

The book Cities and the Environment: New Approaches for Eco-Societies has this outlook on cities: "... the promise of cities is not being realized in many cases owning to poor environmental management, destructive and unregulated commercial and industrial practices, rampant production and disposal, inadequate public planning, and a failure of urban actors to

work together to address problems in a spirit of community and unity of purpose" (p. 2). The thought is that viable solutions have been elusive because of various conflicts of interest, economic pressures, closed governments, public ignorance, and so forth. These conflicts will have to be addressed in order to combat the environmental issues that impact urban areas. Such issues are increasing waste problems (i.e., trying to acquire new land for waste disposal, generation of pollution, disposal-caused resource depletion, and costs for waste processing); health complications from general pollution (i.e., incineration of garbage, industrial emissions, and automobile exhaust); and poor water quality (Cities and the Environment 4).

Urban environmental problems can be evaluated on a spatial scale, using the following entities as indicators: households, communities, cities, and regions (Cities and the Environment 35):

- Household: garbage generation, spreading of diseases, and air, water, and noise pollution.
- Community: inadequate technology, lack of understanding or comprehension of environmental issues, natural disasters, noise pollution, and waste dumping.
- City: traffic congestion, reduced property values, lost heritage, inadequate financial revenues, inappropriate energy supplies, various types of pollution, waste dumping, and accidents.
- Region: lost of habitat, endangered biodiversity, soil erosion, runoff and acid rain, climate change, global warming, land clearance, and other disasters.

It is often the case that health impacts are greater at the household level and diminishes as the spatial scale increases outward (i.e., a hazardous spill or the accumulation of waste and debris at a local facility would have the greatest impact on the surrounding homes and residents, and this

impact would diminish the further away the distance). Issues usually arise when basic services are not equally provided across neighborhoods and communities and no responsibility is taken for these actions (Cities and the Environment 35).

3.2- Current Issues and Trends

One of the biggest obstacles facing cities and urban centers is the slow acceptance of its responsibilities regarding environmental problems. A point was made by author Rodney R. White that could definitely apply to these specific locations: "... human society urgently needs to rethink its relationships with the planet and the relationships between its various members ..." (p. 2).

It has only been within recent decades that urban areas have been associated with the environment on a global scale, since most of the time the idea of environmental problems was limited to the cities themselves (White 8). Traditional environmental issues, such as water, energy, air quality, and solid waste management, are easier to comprehend because they encompass everyday activities, but many individuals are starting to see that other, less-evident issues are also present that aren't necessarily locked into the urban environment (i.e., problems of greenhouse gases, stratospheric ozone depletion, and acid deposition) (White 9).

For urban planners, managers, and other key players in changing the environmental conditions of urban centers, there needs to be the realization that some systems will not return to equilibrium due to irreversible impacts, so solutions will have to be feasible for the various conditions that arise (White 10-11). Also, there needs to be a balance between natural and built environments with cities' ecological and economic objectives (Cities and the Environment 38). In order to thrive in all arenas, economic objectives should be tempered with sustainable living.

Another problem that will have to be addressed is the cultural values that perpetuate the current state of cities and urban areas. In Derelict Landscapes, it is stated that "it becomes our purpose, therefore, not only to identify significant cultural values driving and containing dereliction in America today, but also to identify the principal value manipulations- to signify which interests in society benefit from dereliction and thus promote it" (Jackle and Wilson 32). Cultural values are molded into our everyday activities, our public institutions, our media, and so on. If it is not emphasized that environmental issues are important and needs to be addressed in order to help revitalize communities and neighborhoods, the concept will be lost. An environment can be transformed by perceptions due to distances from potential hazards, physical barriers between citizens and those hazards, and a resident's personal experiences (Greenberg 30). According to authors Michael R. Greenberg and Dona Schneider, "the actual risks and benefits associated with physical and behavioral attributes are filtered by images and values strongly influenced by age, economic status, ethnicity/race, education, mass media exposure, and experiences with other neighborhoods. Filtering leads to transformation of actual neighborhood characteristics into perceived hazards and amenities" (pg. 6). Through active development and commitment by city officials and developers, the negative perceptions residents have of their communities can be potentially reversed.

Land Use Planning

To get the most benefits out of existing neighborhoods and developed areas, city developers need to implement efficient land use planning. Land use planning can be defined as the following:

- "A systematic attempt to minimize the adverse effects land changes have on society and environments and to maximize human benefits" (Neighborhood Planning)

or

- "The process of protecting and improving the environments in a city through the proper use and development of land" (Neighborhood Planning)

There are various reasons for implementing land use planning. First, it provides a framework for key players (i.e., city staff and council members, developers, neighbors, and investors) to establish decision making, discuss current and future land uses, review neighborhood plans, and provide guidance. Second, there is the establishment of balanced solutions to meet social, economic, and environmental needs (i.e., neighborhood desires, investment opportunities, and protection of natural and cultural diversity). Third, better communication and cooperation are achieved among stakeholders because there is knowledge sharing and open dialog taking place. Last, there is more public participation where the general community (i.e., residents, businesses, associations, and interest groups) can voice opinions in formal/informal meetings and sessions (Neighborhood Planning). Typical land use planning covers the following land use categories:

- Residential/Mixed Use: rural residential, single-family, higher-density single-family, mixed residential, multifamily, mixed-use/office, high density mixed-use
- Commercial/Industrial: office, warehouse/limited office, commercial, industrial
- Civic/Open Space: environmental conservation, recreation and open space, civic, utilities
- Special Purpose: agriculture, major impact facilities and planned development (may encompass other land uses), mobile homes, transportation, water sources

Usually the participants in land use planning establish principles that define or guide the proposed uses. The following are typical examples:

- Ensure decisions will not create arbitrary development patterns
- Ensure adequate and diverse housing is available for all income levels
- Minimize negative effects between incompatible land uses
- Recognize suitable areas for public uses and services (i.e., hospitals) that will not overly impact residential areas
- Discourage intense uses within and/or adjacent to residential areas
- Minimize development in environmentally-sensitive locations
- Ensure adequate transition between adjacent land uses and development intensities
- Protect and promote historical/cultural areas
- Balance individual property rights with community interests and goals

Such planning will be needed if cities and urban areas decide to implement corridors or buffers in needed areas.

Urban Option 1: Greenway

One option of urban corridors that are being implemented nationwide is greenways. A definition of a greenway is a "vision of natural corridors crisscrossing a landscape otherwise transformed by development" (Flink and Searns xv). A second definition is that it serves a dual function, providing "... open space for human access and recreational use, and they serve to protect and enhance remaining natural and cultural resources". These planned greenways usually consist of narrow strips of land formerly developed or planned (i.e., railbeds and floodplains),

but are now considered potential community resources. There are many benefits stemming from greenways (Flink and Searns 1-2):

- Act as habitat corridors for plant and animal species diversity
- Can absorb surface runoff contamination and cleanse & replenish air through trees, shrubs, and other vegetation
- Provide a place for urban recreation (i.e., jogging, walking, biking, and fishing)
- Provide alternative routes of transportation, which lessens the dependence on automobiles and promotes better air quality and less road congestion

There are five general types of greenways, which are the following (Flink and Searns xv-xvi):

- Urban Riverside: "... usually created as part of (or instead of) a redevelopment program along neglected, often run-down city waterfronts..."
- Recreational: features "... paths and trails of various kinds, often of relatively long distance, based on natural corridors as well as canals, abandoned railbeds, and public rights-of-way"
- Ecologically Significant: "usually along rivers and streams ... to provide for wildlife migration and species interchange, study, and hiking"
- Scenic and Historic: "usually along a road, highway or waterway ... to provide pedestrian access along the route or at least places to alight from the car"
- Comprehensive System/Networks: "usually based on natural landforms such as valleys and ridges but sometimes ... create an alternative municipal or regional green infrastructure"

Though these types may seem unique, they can easily blend and overlap.

When deciding to implement a greenway, there are many initial steps that take place. First, find a suitable resource corridor for the appropriate needs. Consider what it has to offer, if there are any unique landforms, exceptional flora or fauna, any historical and cultural value, if the land is continuous or has gaps, what outside interest lies in the land, and how much of the land is privately or publicly owned (Flink and Searns 10-11).

Second, decide what the main theme or primary function of the greenway will be. Decide if it will be for recreation, preservation, economic development, or a combination of various themes. Common themes are non-motorized trails for recreation, commuter routes, and safe walkways (Flink and Searns 11-12).

Third, develop a vision statement that will describe the potential operations or functions of the land. This statement will project to potential stakeholders (such as investors, endorsers, or volunteers) the basis for their contributions (Flink and Searns 12).

Fourth, consider the feasibility of the greenway. Decide what the costs will be, if there will be political support, what the current ownership of the land is, how big or small the scale of the land, and what will be the operations and maintenance of the greenway (Flink and Searns 12-13).

Fifth, have an understanding of the affected community and its transportation, recreational, environmental, utility, and open-space needs. Establishments to research for this information are the local planning department, the chamber of commerce, or the visitor's bureau (Flink and Searns 13-14).

Sixth, decide who will provide leadership or direction for the implementation and development of the greenway project. Besides getting the word out in the grassroots circuit, there

should be individuals involved who can open doors for fundraising support and publicity (Flink and Searns 14).

Seventh, start a pilot project to get an understanding of what the greenway may be like in the future. An idea is to start with a small section of the total space, then expand as the pilot project becomes more successful or easier to manage (Flink and Searns 14).

Eighth, begin to look for seed money to fund the development of the greenway. Supporters can be city council members, county commissioners, other public agencies, private foundations, corporations, service organizations, and other individual donations (Flink and Searns 14).

Ninth, consider who will be the staff and personnel providing consulting services for the project. Such persons would assist with environmental assessments, land-use planning, landscape design, and engineering. There would also be personnel to provide legal and technical advice (Flink and Searns 15).

Lastly, develop the phasing for the project such as groundbreaking, media presentation, and opening ceremonies (Flink and Searns 15).

After these initial steps are taken, a suitable area should be selected and mapped out, and an inventory should occur (Flink and Searns 29-30). The analysis should answer the following questions:

- What is the current land use? (i.e., agricultural, residential, industrial, etc.)
- What land uses are permitted?
- Is the land zoned for a particular use?
- What affect would the greenway have?
- How will it affect natural environments?

In addition to scoping suitable locations, various other assessments will have to take place (Flink and Searns 31-38):

- Environmental: identify vegetation, geology, soils, hydrology, topography, wildlife, and microclimate
- Transportation Patterns: public transportation (buses, subways, railways, taxis, trolleys), road conditions, accessibility
- Socioeconomics: political jurisdictions, governing laws/regulations, supporting organizations, fiscal resources/constraints, and community events
- Historic/Cultural Resources: historical landmarks, community centers, churches, neighborhood/community town halls
- Public/Private Infrastructures: location/condition of sanitary sewer lines, water lines, electrical lines, fiber optic cable connections, telephone connections, oil/natural gas, and storm sewer lines
- Other Impacts: views within/outside the particular corridor, light/dark areas, temperature changes, open/closed landscape, the height/width of the landscape, odor, noise, and sense of security

There are various examples of successful greenways programs that have been implemented across the country, one being in Chattanooga, Tennessee. Once considered America's most polluted city by 1970, Chattanooga has worked hard to redevelop its negative image and revitalize an urban area and neglected riverfront (Global Issues, Green Cities). One option reviewed by Chattanooga city officials, Hamilton County officials, developers, and the Parks, Recreation, Arts & Culture Department was the creation of an urban trail system, or greenway, in the city. The idea was that its purpose would be "both environmental and

recreation; it gives urban citizens a chance to keep nature close by, and it reserves property from urban development, often connecting neighboring communities." (Greenways) The resulting Greenways Program currently consists of four components: Blue Blazes Historic Trail, North Chickamauga Creek Greenway, South Chickamauga Creek Greenway, and the Tennessee Riverpark (Chattanooga's Greenways & Parks):

- Blue Blazes Historic Trail: a 1.5 mile loop located near a golf course that hosts interpretive signs of Native American and Civil War information
- North Chickamauga Creek Greenway: linear park located adjacent to the Chickamauga Dam that offers open park space, picnic facilities, trailside benches, canoe launches, and restroom facilities
- South Chickamauga Creek Greenway: a 2.5 mile trail (which encompasses the Brainerd Levee) that is used for leisure purposes
- Tennessee Riverpark: a 12 mile handicapped accessible trail that encompasses the Walnut Street Bridge (the longest pedestrian bridge in the world) and leads through the downtown area, Bluff View Art District, the University of Tennessee at Chattanooga, Amnicola Highway industrial plants, the Amnicola Marsh, and ends at Fishing Park (Chattanooga Greenways Program)

Overall, the project calls for more greenway trails along the Tennessee River tributaries (i.e., Chattanooga Creek, Mountain Creek, and Lookout Creek), which will reconnect with the Riverpark (Chattanooga Greenways Program). One such addition (connecting Chattanooga with the city of East Ridge at the South Chickamauga Greenway) calls for the implementation of a historical and renovated 1920s-era steel bridge (Old Suttle Mill Bridge) that was rescued from Walker County, Georgia (Gilbert). The success of the greenway programs in Chattanooga was

inspired various projects and groups across the country, including the Black Warriors-Cahaba Rivers Land Trust in Birmingham, Alabama (Jefferson County) and the Western North Carolina Alliance and the Asheville Greenway Commission. According to Rick Wood, project manager for the Trust Public Land (TPL) Land Trust Alliance in Chattanooga, "greenways are 'good for the environment. They protect the environment because it keeps people's attention and eyes on the resource. It is also for recreation and fun for the family, and finally they're an alternate form of transportation'" (Riddell). A better summary comes from Charles E. Little, who says, "greenways are a testament to the need to protect our lands and keep the alive, healthy, and green. The community-based, democratic effort to bring greenways about is composed of hard-working, ordinary people who are dedicated to improving the quality of their everyday lives by preserving and connecting remnants of nature near their homes and work places".

In addition to the greenway located in Chattanooga, other successful urban greenways include the Burke-Gilman Trail (Seattle), Tallahassee-St. Marks Historic Railroad State Trail (Tallahassee), San Antonio Riverwalk (San Antonio), Loop Links (Portland), C & O Canal and Townpath (Washington D.C.), Fred Marquis Pinellas Trail (Pinellas County, Florida), and Hogtown Creek Greenway (Gainesville, Florida) (About Greenways).

Urban Option 2: Mixed-Use Zones

Another option for urban areas is the redevelopment of blighted or underused locations into mixed-use zones. A mixed-use zone is defined as "an area that is appropriate for a mix of residential and non-residential uses" (Neighborhood Planning). Mixed-use zones typically promote the following:

- Encourage more retail and commercial services within walking distance of residents

- Allow live-work/flex space on existing commercially zoned land in the neighborhoods
- Allow mixture of complimentary land use types (i.e., housing, retail, offices, commercial services, and civic uses)
- Create viable development opportunities for underused or undeveloped center city sites
- Encourage transition from non-residential to residential uses
- Provide flexibility in land use standards to anticipate changes in the marketplace
- Create additional opportunities for the development of residential uses and affordable housing
- Provide on-street activity in commercial areas after dark and provide built-in customers for local businesses

When converting an existing area into a mixed-use zone, there are certain things to consider. Development should take place along major existing corridors or intersections, or along the edge of existing neighborhoods. This allows neighborhoods to have privacy and security for their homes, while still creating services and economic growth for the surrounding area. Usually industrial zones are not compatible because of the nature of the operations and the accompanying effects (greater emissions, vehicular traffic, etc). According to Silicon Valley Manufacturing Group, "incompatible land uses in proximity to one another may burden a community with controversy that must be managed at great exposure to all concerned, or it will be resolved by the loss of businesses vital to the economic well-being of the community" (Non-Industrial Uses). Developing a mixed-use zone in the middle of residential and industrial areas may help to bring

an even transition or buffer between zones and provide a more complimentary mix of local development (Neighborhood Planning).

Another thing to consider is the health and safety implications of various land uses being linked in one zone. Developers should evaluate the different land uses that will be represented and the inhabitants utilizing those areas, and address the following (Non-Industrial Uses):

- Hazardous Material Storage and Management: the type and quantity of materials stored now and in the future; evacuation routes; responder availability
- Air Emissions: harsh emissions and their operations may irritate "sensitive receptors" (i.e., public and private schools, day care centers, residential areas, etc)
- Facility Security and Liability Issues: risks of unauthorized people on facility property; unauthorized parking on parking lots
- Community Comfort and Safety Issues: concerns or annoyance with nuisance odors and water vapor; excessive noise and emissions clouds from equipment (i.e., compressors and chillers); continuous lighting; limited public parking; damaged roads

3.3- Conclusion

The environmental redevelopment of cities and urban centers will require more than general land acquisition and construction. It will also consist of underlying socioeconomic issues that perpetuate the current conditions cities and urban areas are facing (i.e., abandoned industrial centers and overall dereliction). By aligning the key players together to overcome these socioeconomic problems, the concept of developing an urban corridor for environmental revitalization (and possible economic prosperity) can possibly be realized. As detailed, an option that private and public planners can consider is developing greenways, a specific sort of urban

corridor. Hopefully the idea of these structures will be realized during the methodology processes.

Chapter 4: Methodology

The following is an outline of steps that were taken:

4.1- Research of Background Materials

Researched background material on the concept of implementing buffers or corridors in the vicinity or residential and industrial zones to ease environmental impacts:

- Defined the structure or design of cities and urban areas
- Outlined typical land uses or zones designated in cities or urban areas
- Identified environmental issues affecting cities and urban areas
- Defined land use planning and its relationship to improving environmental conditions in cities and urban areas
- Identified urban buffer or corridor options for improving environmental conditions (i.e., greenways and mixed-use zones)

Research was conducted at the Detroit Public Library (main branch), Southfield Public Library (main branch), and Mansfield/Richland County Public Library (Ontario branch). Research was also conducted using electronic resources via the internet.

4.2- Case Study Investigation (Mansfield, Ohio)

Investigate a city or urban area that fits the description of locations discussed in the background research:

- Research historic and current information on Mansfield, Ohio
- Identify environmental problems impacting the city
- Investigate land use patterns (specifically those areas with residential and industrial zones adjacent or in close proximity to one another)
- Identify key stakeholders (i.e., residents, local industrial businesses, city officials, interest groups, developers, etc)

The first step taken in obtaining information on the case study city (and accompanying documentation) was researching electronic resources via the Internet. The official website of the city of Mansfield provided the names and contact information of various departments which could potentially provide data for the research.

The next step was contacting departments provided on the city of Mansfield website. The departments chosen were the following (City of Mansfield Website):

- Building & Codes Department (contact: Harold Norris)
- Community Development Office (contact: C. Baker)
- Economic Development Director (contact: Timothy Bowersock)
- Fair Housing Commission (contact: Donnie Mitchell)

The initial contact with each department was an email message stating the requester's personal information, the purpose of the inquiry (thesis research), and the request to obtain additional information. It was also stated that a follow-up phone call would occur to confirm each contact's willingness to provide information or data. Timothy Bowersock (Economic Development Director) sent confirmation to provide information via an email message. C. Baker (Community Development Office) also sent confirmation declining the offer via an email message. In preparation for interviews with the contacts, interview questions were developed (as an aid in

gathering the data). Responses were not received from the Building & Codes Department or the Fair Housing Commission.

A visit was made to the city of Mansfield Municipal building, which was composed of the various departments listed on the city's website. Inquiries were made in the Building & Codes Department, where a zoning map of the city of Mansfield was purchased and an informal interview was conducted with Harold Norris (he also gave reference to the city of Mansfield's Codified Ordinances). Contact information was also provided for Linda Price, the Director of Zoning, whom also worked in the office (Ms. Price was later contacted via a telephone call; the voice message requesting information and an interview was not returned). Next, inquiries were made in the Fair Housing Commission, where Donnie Mitchell provided the newly created Mansfield, Ohio Five-Year Consolidation Plan 2004-2009, as well as answered informal questions based off of the interview sheet. Lastly, inquiries were made in the City Engineer Office, where introductions were made with Timothy Bowersock (Economic Development Director) and James DeSanto (city engineer) (Mr. DeSanto was later contacted via a telephone call; the voice message requesting information and an interview was not returned). After the visit, the interview questions developed for the Economic Development Director and Fair Housing Commission were emailed to Timothy Bowersock and Donnie Mitchell respectively (responses were returned at a later date).

A visit was made to the Richland County Regional Planning Commission office to obtain information on the objectives of the group, as well as their role in economic development and construction within the city of Mansfield. An informational pamphlet (the Richland County Regional Planning Commission Status and Progress Report 2003-2004) was obtained, but no interviews were conducted (nor were personnel contacted).

The final step was reviewing the documents obtained from the city departments, which provided information on the type of environmental problems potentially affecting the city, the various kinds of land-use patterns located within the city, and the different stakeholders involved. The Mansfield, Ohio Five-Year Consolidation Plan 2004-2009 (provided by Donnie Mitchell, Fair Housing Commission) listed details of the land-use patterns and zones around the city, as well as the demographic trends of these zones. In addition, review of Mansfield's Codified Ordinances and the city's zoning map gave more details about the zones established by the city council. The interview responses from Donnie Mitchell, Timothy Bowersock, Harold Norris, and the consolidation plan (as well as an interview from a local resident) generated information on the likelihood of environmental impacts in the city. Lastly, all of the documents and interviews reviewed gave insight to the stakeholders involved in the decisions, discussions, and considerations of land-use planning and corresponding environmental impacts in the city.

4.3- Analysis of Buffer/Corridor Options

Analyzed if an urban buffer or corridor can be implemented in the investigated city or urban area:

- Investigated areas that have potential for buffer or corridor development projects
- Compared to other cities that attempted to implement urban buffers or corridors
- Made determination on viability of project(s) implemented in Mansfield, Ohio

The first step was to observe different locations around the city of Mansfield and determine the type of structures present and the uses taking place in the various zones.

Photographs were taken of the different locations and compared to the zones and land-use patterns identified in the Consolidation Plan and zoning map.

The next steps were to compare and contrast the city of Mansfield with other cities currently utilizing urban buffers/corridors or green spaces (specifically the cities, such as Chattanooga, Tennessee, previously researched in earlier chapters). Additional information was provided by the Trust for Public Land (TPL) Chattanooga office for this comparison portion.

Chapter 5: Results

5.1- Research of Background Materials

This research was conducted and presented in Chapter 1, Chapter 2, and Chapter 3.

It was expected that research would address issues of urban environmental dereliction due to industrial practices and lack of awareness. The resulting information did provide data on industrial impacts, city and residential impacts, and solutions for urban planning. The results also included various options for improving or promoting urban corridors and buffers.

5.2- Case Study Investigation (Mansfield, Ohio)

The majority of information used to investigate the status of Mansfield, Ohio was obtained from the Mansfield, Ohio Five-Year Consolidation Plan 2004-2009, the city of Mansfield Codified Ordinances, the city zoning map, and interviews conducted with the city's Fair Housing Commission, Building & Codes Department, and the Economic Development Director.

The Mansfield, Ohio Five-Year Consolidation Plan 2004-2009 is a document that was developed by the city's Community Development Department and various other city offices and

groups. The purpose of the consolidation plan is to describe "the community needs, resources, priorities, and proposed activities to be undertaken under certain U.S. Department of Housing and Urban Development (HUD) programs ..." (Mansfield, Ohio). The plan has five main components:

- Citizen Participation and Consultation
- Housing and Homeless Needs Assessment
- Housing Market Analysis
- Five-Year Strategic Plan
- One Year Action Plan

The consolidation plan is a result of projects conducted under the Community Development Block Grant (CDBG) Program. Established with the passage of the Housing and Community Development Act of 1974, the CDBG program distributes monies through entitlement funds for cities and counties, and through grants for states participating in annual competitions for non-entitlement funds. In order for the city of Mansfield to quality and participate in the CDBG program, it must adhere to the following regulations (Mansfield, Ohio):

- Fall within acceptable activities specified under the program (i.e., acquisition/disposition of real estate, housing rehabilitation, new housing construction, etc)
- Do not fall within the category of ineligible activities specified under the program (i.e., buildings used for general conduct of government business, etc)
- Meet one of three national objectives:
    - Benefit low and moderate (L/M) income persons
    - Aid in the prevention or elimination of slums or blight

    - Meet other community development needs having a particular urgency
- Meet specific categorical limits:
    - Funds used for 1-3 consecutive years
    - 70% of funds must benefit activities for L/M income persons
    - 15% of the funds per year must not exceed use for public services
    - No more than 20% of total funds can be used for planning and administrative costs
- Use for special economic development projects
- Must abide by Title V of the Civil Rights Act of 1968 (Fair Housing Act)

The city of Mansfield has received CDBG funds since 1975, which has been the result of appropriations approved by the U.S. Congress. Listed below is the funding the city has received for the last five years (Mansfield, Ohio):

- Year 2000: $1,118,000
- Year 2001: $1,128,000
- Year 2002: $1,190,000
- Year 2003: $1,189,000
- Year 2004: $1,152,000
- Five-Year Average: $1,155,000

The information primarily used from the consolidation plan was the demographic profiles and market analysis based on the 2000 census, the land-tract designations, the land-use maps, and the housing statistics (other topics, such as population trends and reported incidents, were mainly used as reference).

The Codified Ordinances and zoning map were developed jointly by the Building & Codes Department and the city council. The following ordinances provide detailed information on the land practices allowed within the city:

- Chapter 1167: Zoning District Regulations
- Chapter 1165: Establishment of Zoning Districts and Map

The final zoning and land-use patterns regulations are approved by the city council (which is documented in an ordinance) and the Building & Codes Department assists the public with general zoning inquiries, building permit applications, maps, and so forth. These zones and land-use patterns will be further reviewed under the section titled "Land-Use Patterns".

It was expected that research on the city would identify land-use patterns and zones established for these uses, as well as trends and/or records of environmental impacts of city residents and structures. The resulting data provided in-depth analysis of Mansfield's demographics, housing profiles, and residential income. Though information was available on the types of businesses and industries currently located in the city, there was not abundant statistics on their financial and environmental impacts. Thus, impacts were measured based on interviews and physical observations.

Historical and Current Data

The city of Mansfield (area size 29.9 square miles) is located in Richland County, Ohio. The city is situated in the Appalachian hills of north-central Ohio, approximately 65 miles northeast of Columbus (the state capital) and 79 miles southwest of Cleveland (the state's largest city), and is currently geographically centered as the county seat of Richland County (some of the surrounding communities are the cities of Ontario, Lexington, Crestline, Shelby, Bellville,

Madison, and Galion). The city was founded in 1808 and named after then-U.S. Surveyor General Colonel Jared Mansfield. At the time of its founding, the city's current location was home to the Mound Builders, Erie, Iroquois, Algonquin, Wyandot, Shawnee, and Delaware Native American tribes (Mansfield, Ohio). Today, Mansfield is home to various facilities and attractions, including the Ohio Bird Sanctuary, the Ohio Genealogical Society, the Ohio State Reformatory, Malabar Farm State Park (estate of author/conservationalist Louis Bromfield), Richland Carrousel Park, Mid-Ohio Speedway, and fruit farms by the legendary John Chapman, better known as "Johnny Appleseed" (Attractions).

The city of Mansfield is demographically diverse on many levels. Listed below is the general breakdown of the city's population and market analysis (Mansfield, Ohio):

- **Total Population**
    - 51,6000 (includes population from two correctional facilities)
    - Under 25 years old: 33% (compared to U.S. median of 35%)
    - 65 years & older: 15.5% (compared to U.S. median of 12.4%)
    - Median Resident Age: 36.4
- **Housing**
    - Total Units: 20,182
    - 42% Housing Units: renter occupied (39% increase from 1990)
    - 556 units not for sale or for rent
- **Income**
    - Median Income: $30,176 (34% increase from 1996)
    - 14,891 households earned $40,655 (compared to $53,000 for the state)
    - 16% Residents: income below poverty level (compared to 11% for the state)

- 4.7% Households: receive public assistance (compared to 3% for the state)
- 11% Households: earned over $75,000 (compared to 16% for Richland County; 20% for the state)

- **Employment**
  - 26% County Employment: manufacturing (manufacturing jobs approximately 22,000)

- **Race/Ethnicity**
  - White (Non-Hispanic): Mansfield (78%); Richland Co. (88.2%); State (85%)
  - Black/African American: Mansfield (19.6%); Richland Co. (9.4%); State (11.5%)
  - Asian/Pacific Islander: Mansfield (0.6%); Richland Co. (0.5%); State (1.2%)
  - Hispanic/Latino (any race): Mansfield (1.2%); Richland Co. (0.9%); State (1.9%)
  - Two or More Races (other): Mansfield (2.1%); Richland Co. (1.3%); State (1.4%)
  - Native American/Indigenous: Mansfield (1.4%); Richland Co. (0.2%); State (0.2%)

Land-Use Patterns

The Codified Ordinances developed for the city of Mansfield has established specific zones which regulate public use and development projects. They are also illustratively demonstrated in a zoning map. Listed below is the city zones discussed in Chapter 1167: Zoning District Regulations (Codified Ordinances of Mansfield Ohio):

Table 1: City of Mansfield Zoning Specifications

Section	Title	Purpose	Permitted Uses (examples)	Conditionally Permitted Uses (examples)	Subject to Area/ Height/Bulk Regulations?
1167.01	R-1: Residential District	Accommodate low density residential development (up to 4 dwelling units per	One-family detached dwellings, Parking spaces	Cemeteries, Churches, Schools, Public parks,	Yes

		acre) and help preserve established neighborhoods with single-family homes		Recreation centers	
1167.02	R-2: Residential District	Accommodate for medium density one and two-family residential development (up to 7 dwelling units per acre). Allows for construction of less expensive housing on smaller lots.	One-family detached dwellings, Two-family dwellings, Parking spaces Also subject to regulations for "common wall houses" (two-family structures)	Same as R-1	Yes
1167.03	MF: Multi-Family Residential District	Accommodate for mixture of one and two-family residential uses with townhouses and multi-family apartments (higher density that R-1 and R-2). Acts as transition zone between lower density developments and predominantly commercial areas.	One-family detached dwellings, Two-family dwellings, Multi-family and townhouse dwellings (maximum height and levels), Parking spaces	Same as R-1. Additional include nursery schools, Day nurseries, Day care centers (not part of a church), Group homes, Senior citizen complexes, Nursing homes, Bed & breakfast establishments, Multi-family dwellings (larger specs), Parking spaces	Yes
1167.04	OS: Office Service District	Provide for office uses along major thoroughfares, provide transition between residential and general business areas, and allow for residential conversions to office spaces.	One-family detached dwellings, Two-family dwellings, Multi-family and townhouse dwellings (maximum height and levels), Office buildings with specified occupants (i.e., real estate, banks, fraternal organizations, etc), Convalescent homes, Bed & breakfast establishments, Utility Offices, Parking spaces	Same as MF. Additional include barber shops, Beauty shops	Yes
1167.05	B-1: Neighborhood Business District	Provide uses to serve convenience shopping and personal needs of residential areas. Will also cater to pedestrian shoppers and motorists.	Personal service establishments (i.e., barber shops, beauty shops, Laundromats, dry cleaners, repair shops, photography studios, etc), Retail businesses not exceeding 5000 sq. ft, (i.e., grocery stores, liquor stores, dry goods, hardware stores, apparel stores, etc), Bed & breakfast establishments, Office buildings, Veterinary offices, Utility offices, Multi-family and townhouse dwellings, Parking spaces, Sales and service establishments	Same as B-1	Yes
1167.06	B-2: General Business District	Provide for more diversified business establishments which aren't usually located adjacent to residential neighborhoods. Uses are community or regional in nature.	Department stores, Supermarkets, Newspaper publishings, Furniture stores, Processing of food and drink, Commercial recreation facilities (i.e., bowling alleys, billiards halls, skating rinks, etc),	Same as B-1. In additional gasoline service stations, New/used automotive sales and repair shops, Car washes, Funeral homes, Light manufacturing businesses.	Yes

			Post offices, Government buildings, Hotels, Motels, Cultural establishments, Building materials dealer, Repair shops, Mini-warehouses, Vet hospitals, Parking spaces		
1167.07	CB: Central Business District	Center of business and commercial activity and allows for multiple business, retail, office, public, quasipublic, and residential uses.	Multi-family dwellings, Parking spaces, Micro-breweries	Same as B-2	Yes
1167.08	I-1: Limited Impact Industrial District	Creates areas where manufacturing and industrial uses occur with no or very low nuisance. Should not have undesirable or detrimental effects (i.e., noise, odor, smoke, etc) on adjacent residential/business districts.	Industrial equipment sales and rentals, Warehouses, Recycling centers, Construction trades, Lumber yards, Printing and publishing, Bakeries, Freight garages, Parking spaces	Eating and drinking establishments, Public parks, Recreational facilities, Public swimming pools	Yes
1167.09	I-2: General Impact Industrial District	Creates areas where industrial uses occur with high nuisance. Associated nuisances (i.e., unsightliness, noise, odor, traffic, etc) would not have an impact on adjacent residential/commercial areas due to remote locations and large land acreage.	Automobile assembly, Boiler shops, Machine shops, Fabricating shops, Breweries, Brick/pottery/tile manufacturing, Bulk stations, Cement/concrete mixing, Coal/coke yards, Enameling, Flour/grain mills, Foundries, Oil goods manufacturing, Sewage disposal plants, Steam plants, Tool & Die/metal fabricating, Scrap metal storage, Automobile wrecking, Parking spaces	Eating and drinking establishments, Public parks, Recreational facilities, Public swimming pools	Yes
1167.10	Special Zoning Districts	For uses which accommodate the community, but do not fir or aren't compatible with the uses of the permitted district (i.e., health services, affordable alternative housing, etc)			
1167.11	MH: Mobile Home Park District	Provide alternative low cost housing and location for mobile home uses.	Must meet specific location requirements	Same as R-1. Additional include convenience grocery stores, laundries	Yes
1167.12	MH/R: Mobile Home Residential District	Allow for existence of mobile homes on industrial lots or land parcels in residential districts. Promotes mixture of residential and mobile home uses.	Same as MF. In addition must meet the Mobile Home Construction and Safety Standards set under the Department of Housing and Urban Development (HUD)	Same as MF	Yes
1167.13	HS: Health Services District	Provide area for full-range health services and related uses.	Institutions for medical care, Doctors'/physicians' offices, Dentist offices, Hospitals, Clinics, Nursing homes, Dormitories for those in	Drugstores (not exceeding 3000 sq. ft), Floral shops, Publicly owned/operated buildings, Multi-family dwellings	Yes

			the medical profession, Multi-family/townhouse dwellings, Parking spaces		
1167.14	A: Airport Development District	Provide for or to encourage development of land at and surrounding the Mansfield Lahm Airport.	Air passenger/freight terminal buildings, Air national defense installations, Air maintenance/repair installations, Air control/weather facilities, Hangar/aircraft parking facilities, Public parks, Parking spaces	Same as I-1. Additional include restaurants/private clubs, Hotels/motels, Research/development within enclosed building	Yes

As listed in the ordinance table, below are the zoning types specified on the zoning map:

Table 2: City of Mansfield Zoning Map Key

Zone/ Shade Label	Zone/ Shade Type
R-1	Residential
R-2	Two-Family Residential
MF	Multi-Family Residential
OS	Office Service
B-1	Neighborhood Business
B-2	General Business
CB	Central Business
I-1	Limited Impact Industrial
I-2	General Impact Industrial
MH	Mobile Park Home
MH/R	Mobile Home/ Residential
HS	Health Services
A	Airport Development
PDP	Planned Development: Professional
PDR	Planned Development: Residential
Yellow Shading	Historic Preservation District
Red Shading	Former Township Zoning in Effect

Next is the land-tracts outlined in the Mansfield, Ohio Five-Year Consolidation Plan 2004-2009. Based on the 2000 census data, the city was divided into 19 land-use tracts and profiles were characterized for each. Listed below are the specific tracts and their corresponding city zones:

Table 3: City of Mansfield Census Tract Data

Tract #	Description	LMI %	Characteristics	% of Poor and Lower Condition Dwellings	Home Construction Periods of Most Homes	Zones
1	Central Business District	86.6	Mostly commercially zoned land-use	84.0	1900-1920	CB, MF
2	Old Heavy Industrial Area	75.7	Mostly industrial land-use	83.8	1900-1920	CB, I-1, I-2, B-2, MF
3	Oldest Developed Areas	67.4	Mostly residential land-use	56.5	1900-1920; 1941-1960	B-2, B-1, MF, I-1
4	Residential	52.6	Mostly residential land-use; large public parcels	25.3	1921-1940; 1900-1920	B-1, R-2, MF, OS
5	Residential	52.6	Mostly residential land-use	29.7	1921-1940; 1900-1920 and 1941-1960	R-1, OS, MF, B-2, HS, B-1, I-1, CB
6	Residential	67.7	Mostly residential land-use; large public parcels	61.0	1900-1920; 1921-1940	CB, MF, I-1, I-2, OS, B-1, R-1, B-2
7	Residential	73.6	Mostly residential land-use	61.4	1900-1920; 1921 and 1941-1960	B-2, R-2, MF, I-2
8	Mixed	63.8	Mixed both residential and commercial land-use	40.7	1941-1960, 1921-1940, and 1900-1920	I-2, B-2, R-2, B-1, I-1
9	Residential	40.0	Mostly residential land-use with mixed commercial and public parcels	5.9	1941-1960; 1961-1980	I-2, R-2, B-2, MF, I-1
10	Residential	47.4	Mostly residential land-use	3.2	1941-1960	MF, B-1, R-1, R-2
11	Mixed	38.3	Mostly residential land-use with large public parcels	0.6	1941-1960	HS, OS, R-2, MF, R-1, PDR
12	Residential	26.1	Mostly residential land-use	0.4	1941-1960; 1921-1940	MF, PDP, OS, R-1, HS, R-2, B-2
13	Residential	30.3	Mostly residential land-use	1.1	1941-1960; 1921-1940	R-2, R-1, Yellow Shading
14	Developing Retail Center (Mixed)	46.7	Mixed both residential and commercial land-use	5.0	1941-1960; 1961-1980	R-2, MF, B-2, R-1, MH, I-1
15	Mixed	60.1	Mostly commercial land-use with residential and public parcels	34.0	1941-1960	OS, I-1, MF, MH, MH/R, Red Shading
16	Mixed	57.6	Mostly residential land-use with commercial	43.6	1941-1960	MF, OS, B-1, R-2, I-1
17	Mixed	26.3	Mixed both public parcels (mostly) and industrial land-	13.5	1941-1960 and 1961-1980	I-1, I-2

			use			
18	Residential	37.8	Mostly residential land-use	5.8	1941-1960 and 1961-1980	B-1, B-2
21	Mixed	23.7	Mostly residential land-use with commercial	0.5	1961-1980; 1941-1960 and after 1980	R-1, MF, B-2, R-2, I-1

It should be noted that land tracts #19 and 20 were identified during the 2000 census, but they were not detailed in the consolidation plan because they fall outside the corporation limits of Mansfield. Also, though land tract #18 is identified, only a small portion of the tract is actually located in the city.

Impact of Environmental Problems

There are two different theories on the environmental problems impacting the city of Mansfield. Responses provided by the Building & Codes Department, the Fair Housing Commission, and the Economic Development Director collectively agree that few environmental impacts occur that would raise serious issues. However, the response from one resident said that serious environmental issues are affecting the quality of life of some citizens and their neighborhoods.

Donnie Mitchell (Fair Housing Commission) contends that the majority of environmental issues the city faces are the presence and possible remediation of underground fuel tanks stored underneath abandoned gas stations. Another issue could be the disposal of materials by industrial businesses that would cause problems in the future. He also noted that lead-based paint may cause a health hazard in older homes that require renovation or are planned for demolition (this was also discussed in the city's consolidation plan). He said that in many cases the costs associated with the environmental concerns (i.e., lead and asbestos abatement, etc) are very high, which usually postpones a project or demolition (Appendix A).

Both Timothy Bowersock (Economic Development Director) and Harold Norris (Building & Codes Department) could site no to few cases where environmental problems were a major impact. However, Mr. Bowersock did say that environmental concerns are taken into consideration for various projects and that the city works with the Ohio and U.S. EPA to identify and clean-up environmental contamination at appropriate locations (Appendix B and C).

A contrasting viewpoint was provided by a resident living within the city. Below is the summary of the interview conducted with the resident's daughter, Ms. Torri Staples (also a resident of Mansfield) (Appendix D):

> "Torri Staples is the daughter of the resident currently residing at 545 Oakenwaldt. The resident (which will be referenced as "plaintiff") is currently pursuing legal action against the Breitinger Company (595 Oakenwaldt), a factory located adjacent to the plaintiff's property. The general claim is in regards to the environmental damage incurred from the factory.
>
> During the mid-1980s, the small family-owned factory was constructed in the residential neighborhood (low/moderate income and predominantly ethnic minority characterization) for the function of producing and packaging automotive and other parts. There was a notice submitted to then-existing neighbors that the facility would be built, but no other public notification can be recalled. The factory is currently located a few feet from the plaintiff's main residence (the plaintiff owns two homes in the neighborhood).
>
> Within the last seven years, larger facility space has been added to the original factory (which includes the construction of two parking lots and the addition of stamping operations). The increased production has resulted in greater truck traffic and related impacts (i.e., wheel tracks, spilled hydraulic fluid, parked trucks, etc), as well as unpleasant industrial impacts (i.e., burning, odors, noise, vibrations, etc). The plaintiff is citing physical (i.e., lack of sleep, constant vibrations, damaged property, etc) and mental stress from the operations taking place.
>
> The plaintiff has notified and complained to both the company and City of Mansfield mayor's office, but no satisfactory results have come about. The plaintiff has obtained an attorney and is in the midst of pursuing legal action against the company. Currently, the situation as stated by the plaintiff has not altered."

The residence of the interviewee's mother is located in land tract #8. Additional demographic profiles include the following:

- 545 Oakenwaldt: immediate neighborhood located in residential and commercial zones
- Low/Moderate Income %: 63.8
- 19 identified major facilities:
  - 8 churches
  - 4 major employers
  - 5 parks/recreation sites
  - 2 public/private schools
- Race/Ethnicity/Gender
  - Total Population: 2996 (male: 1489/ female: 1507)
  - White (Non-Hispanic): 2398
  - Black/African American: 466
  - Native American/Indigenous: 12
  - Asian/Pacific Islander: 17
  - Hispanic/Latino (any race): 52
  - Two or More Races (other): 24
  - Unidentified: 27

Key Stakeholders

Listed are the various stakeholders and parties of interest that are affected by the environmental and zoning impacts (as well as the decisions made in regards to these impacts):

- Mansfield City Council (City of Mansfield Website)
    - Mayor: Lydia Reed
    - City Council President: Virginia Imhoff
    - 1st Ward Member: Doug Versaw
    - 2nd Ward Member: Dave Robinson
    - 3rd Ward Member: Scott Hazen
    - 4th Ward Member: Butch (Walden) Jefferson
    - 5th Ward Member: Dr. Pat Hightower
    - 6th Ward Member: Gary Utt
    - Member-At-Large: Mike Hill
    - Member-At-Large: Don Culliver
- Mansfield City Offices and Departments (City of Mansfield Website)
    - Building Maintenance
    - Communications
    - Community Development
    - Data Processing
    - Fire Department
    - Police Department
    - Finance
    - Human Resources
    - Taxation
    - Litter Control
    - Municipal Court
    - Law Director
    - Recreation
    - Public Works
    - Parks
    - Water and Wastewater Treatment Plants
    - Fair Housing Commission
    - Building & Codes
    - Economic Development Director
- Richland County Regional Planning Commission
- Mansfield residents

- Public and Private business owners (both current and potential)
- Public and Private interests groups (both current and potential)
- State and Federal agencies

5.3- Analysis of Buffer/Corridor Options

It was expected that results would provide general comparison of Mansfield with another city implementing an urban corridor or buffer and provide confirmation that the same plans can be implemented in Mansfield. The resulting data did provide a comparison city (Chattanooga, Tennessee), but results show that both cities are different and have to address separate/different needs, which impacts what type of corridor, buffer, or green space can be implemented. Where Chattanooga had typical air and water issues to address, it was discovered that Mansfield had more issues with noise and aesthetics.

City Comparison

Mansfield is compared to Chattanooga, Tennessee, the city which has been very successful in implementing greenways over the past couple of years.

Chattanooga (the 4th largest city; 135.2 square miles) is located in southeast Tennessee, near the border of Georgia (Chattanooga, Tennessee; Wikipedia) and its mayor is Ron Littlefield. Historically, the city was founded by Cherokee leader John Ross, was the home of Cherokee, Creek, Choctaw, and Shawnee Native American tribes, and was one of the sights of the tragic "Trails of Tears" (Chattanooga). It is the home and corporate headquarters of Krysal, Chattem, UnumProvident, The Chattanooga Bakery, and Miller Industries, and hosts the popular attractions of Lookout Mountain, the Tennessee Aquarium (the largest freshwater aquarium in

the U.S.), and the Chattanooga Choo Choo. As mentioned in the background literature, the city was once titled the "Filthiest City in America". However, through commitment to conservation and natural resource protection, Vice President Al Gore termed Chattanooga "The Environmental City" in 1998.

Listed below are the demographic profiles and land-use patterns/zones for Chattanooga:

- **Population** (Chattanooga Tennessee Population and Demographics)
    - Total: 155,554
        - Male: 73,370 (47.17%)
        - Female: 82,184 (52.83%)
        - White: 92,874 (59.7%)
        - Black/African American: 56,086 (36.06%)
        - American Indian/Native Alaskan: 446 (0.29%)
        - Asian: 2,396 (1.54%) - Includes Asian Indian, Chinese, Filipino, Japanese, Korean, Vietnamese, Other
        - Native Hawaiian/Pacific Islander: 164 (0.11%) - Includes Native Hawaiian, Guamanian, Chamorro, Samoan, Other
        - Some Other Race/Unidentified: 1,571 (1.01%)
        - Hispanic/Latino (Any Race): 3,281 (2.11%) - Includes Mexican, Puerto Rican, Cuban, Other
    - 25 years and under: 51,619 (33.18%)
    - 65 years and older: 23,695 (15.23%)
    - In Households: 149,728 (96.25%)
    - In Group Quarters: 5,826 (3.75%)

        - Institutionalized: 2,763 (1.01%)
        - Non-Institutionalized: 3,281 (2.11%)

- **Housing** (Chattanooga Tennessee Population and Demographics)
    - Total Households: 65,499
        - Family Households: 39,650 (60.54%)
        - Non-Family Households: 25,849 (39.46%)
    - Average Household Size: 2.29
    - Average Family Size: 2.92
    - Occupancy
        - Total Housing Units: 72,108
        - Occupied Units: 65,499 (90.83%)
            - Owner Occupied: 35,946 (54.88%) – Avg. Household Size: 2.4
            - Renter Occupied: 29,553 (45.12%) – Avg. Household Size: 2.15
        - Vacant Units: 6,609 (9.17%)
        - Seasonal, Recreational, Occasional Use: 271 (0.38%)
    - Homeowner Vacancy Rate: 2.5%
    - Renter Vacancy Rate: 8.9%
- **Business Demographics** (Statistics and Demographics)
    - Type of Jobs Available (#): 20,347
        - Services: 8,254 (40.6%)
        - Retail Trade: 4,207 (20.7%)
        - Construction: 1,855 (9.3%)

- Finance/Insurance/Real Estate: 1,661 (8.2%)
- Wholesale Trade: 1,098 (5.4%)
- Manufacturing: 1,087 (5.3%)
- Transportation/Public Utilities: 874 (4.3%)
- Agriculture/Forestry/Fisheries: 468 (2.3%)
- Public Administration: 415 (2.0%)
- Non-Classified Establishments: 380 (1.9%)

o Manufacturing: employment (36,503 or 17.4%)

- **Income** (Chattanooga, Tennessee)
  - o Median Household Income: $32,000
  - o Median Family Income: $41,318
  - o Per Capita Income: $19,689
  - o 17.9% Population/ 14.0% Families below the poverty line

Next are the zoning ordinances and regulations developed by the Chattanooga city council, which is "authorized to established districts or zones within its corporate limits for the purpose of regulating the use of land and buildings, the height of buildings, the size of open space surrounding buildings, and the density of population" (Zoning Ordinance & Regulations). The following ordinances are located in Appendix B: Zoning Regulations:

Table 4: City of Chattanooga Zoning Specifications

Zone Type	Permitted Uses (Examples)	Special Exempted Uses (Examples)	Height & Area Regulations?
R-1: Residential Zone	Single-family dwellings, Schools, Playgrounds/parks, Golf courses, Fire stations, Churches, Home occupations, Day care homes	Day care centers, Kindergartens (non-governmental), Assisted living facilities, Communication towers, Cemeteries, Planned unit developments	Yes
RT-1: Residential Townhouse Zone	Townhouse dwellings, Playgrounds/parks, Gold courses, Home occupations, Accessory uses/buildings	Kindergartens (non-governmental), Day care centers	Yes
RZ-1: Zero Lot Line Residential Zone	Single-family zero lot dwellings, Playgrounds/parks, Golf courses, Home	Kindergartens (non-governmental), Day care centers	Yes

	occupations, Accessory uses/buildings		
R-T/Z: Residential Townhouse/ Zero Lot Line Zone	Single-family detached dwellings, Townhouses, Playgrounds/parks, Schools, Churches, Golf courses, Home occupations	Kindergartens (non-governmental), Communication towers, Day care centers	Yes
R-2: Residential Zone	Single-family dwellings, Two-family dwellings, Schools, Playgrounds/parks, Golf courses, Fire stations, Churches, Day care centers	Kindergartens (non-governmental), Assisted living facilities, Communication towers, Cemeteries, Planned unit development	Yes
R-3MD: Moderate Density Zone	Single-family dwellings, Two-family dwellings, Three-family dwellings, Four-family dwellings, Schools, Playgrounds/parks, Golf courses, Fire stations, Churches, Day care homes	Kindergartens (non-governmental), Communication towers, Cemeteries	Yes
R-3: Residential Zone	Single-family dwellings, Two-family dwellings, Boarding homes, Bed & Breakfasts, Multiple-family dwellings, Schools, Parks, Churches, Day care homes	Kindergartens (non-governmental), Assisted living facilities, Medically assisted living facilities, Manufactured home parks	Yes
R-4: Special Zone	Single-family dwellings, Two-family dwellings, Multiple-family dwellings, Boarding homes, Bed & Breakfasts, Colleges, Churches, Dormitories, Medical clinics, Laboratories, Offices, Studios, Parks, Banks, Drug stores, Museums, Parking garages	Fraternal clubs, Hospitals, Funeral homes, Day care centers, Gift shops, Beauty/barber shops, Social service agencies	Yes
R-5: Residential Zone	Single-family dwellings, Two-family dwellings, Playgrounds/parks, Golf courses, Fire stations, Churches, Home occupations	Day care centers, Kindergartens (non-governmental)	Yes
O-1: Office Zone	Offices, Colleges, Churches, Medical clinics, Laboratories, Fire stations, Parks, Radio/television stations	Fraternal clubs, Transmission towers, Commercial parking lots, Communication towers	Yes
C-2: Convenience Commercial Zone	Retail/sales establishments, Bakeries, Meat markets, Banks, Bowling alleys, Theaters, Office buildings, Restaurants, Hospitals, Commercial billboards, Schools, Churches, Motels, Hotels, Furniture sales, Mini-warehouses	Funeral homes, Small animal hospitals, Open-air markets, Adult-oriented establishments, Kennels, Travel trailer camps	Yes
C-3: Central Business Zone	Any commercial use, Offices, Dwellings units (Certain prohibitions)	Adult-oriented establishments, Day care centers, Monopole communication towers, Liquor stores, Wineries	Yes
C-4: Planned Commercial Central Zone	Department stores, Supermarkets, Eating/drinking establishments, Beauty/barber shops, Dry cleaners, Offices, Studios, Home occupations, Theaters, Vehicular repair facilities	Day care centers, Restaurants (specific seating capacity)	Yes
C-7: Northshore Commercial/Mixed Zone Use	Guidelines: Promote mixed land-use (pedestrian oriented, automobile oriented, etc)	N/A	N/A
M-1: Manufacturing Zone	Boiler works, Forge plants, Foundries, Smeltings, Rolling mills, Recycling process centers	Open-air markets, Day care centers, Adult-oriented establishments, Communication towers, Wineries, Liquor stores	Yes
M-2: Light Industrial Zone	Apparel manufacturers, Blueprint shops, Cold storage plants, Food packaging, Furniture manufacturing, Gas metering, Greenhouses, Lumber yards, Optical goods producers, Textile production, Utility services, Wholesaling, Offices (Certain prohibitions: many businesses in M-1)	N/A	Yes
M-3: Warehouse and Wholesale Zone	Warehousing, Mini-warehouses, Wholesaling, Offices, Re-packaging, Communication towers	N/A	Yes
M-4: Outdoor Industrial Zone	Coal screening, Junk yards, Sawmills, Sanitary landfills, Quarries, Asphalt	N/A	Yes

	plants, Gravel pits (Certain prohibitions: dwellings)		
F/W: Flooding Zone	Lawful uses of other zones within F/W	N/A	N/A
F/H: Flood Hazard Zones	Lawful uses of other zones within F/H	N/A	N/A
A-1: Urban Agricultural Zone	Growing crops, Dairying, Raising poultry/livestock, Horticulture, Floriculture, Livery stables, Detached single-family dwellings, Churches, Parks, Home occupations	N/A	Yes

Next are the specific zones and their corresponding ordinance references (Zoning Ordinance & Regulation):

Table 5: City of Chattanooga Zoning Key

Zoning Label	Zoning Title	Ordinance Reference
R-1	Residential Zone	7677
RT-1	Residential Townhouse Zone	7677
RZ-1	Zero Lot Line Residential Zone	7678
R-2	Residential Zone	7678
R-3	Residential Zone	7678
R-3MD	Moderate Density Zone	7727
R-4	Special Zone	6837
R-5	Residential Zone	6837
O-1	Office Zone	7593
C-2	Convenience Commercial Zone	7593
C-3	Central Business Zone	7462
C-4	Planned Commercial Central Zone	7462
C-5	Neighborhood Commercial Zone	7462
M-1	Manufacturing Zone	6717
M-2	Light Industrial Zone	6717
M-3	Warehouse and Wholesale Zone	6717
F/W	Floodway Zone	7712
F/H	Flood Hazard Zone	7712

R-T/Z	Residential Townhouse/ Zero Lot Line Zone	10184; 10461
C-7	Northshore Commercial/ Mixed Use Zone	10717; 10750
M-4	Outdoor Industrial Use Zone	10811
A-1	Urban Agricultural Zone	11107

Given the above statistics, here are some major comparisons between the two cities:

- Chattanooga has larger land size and population versus Mansfield; Chattanooga's larger size provides more opportunity and land availability for green space projects (such as greenways or other urban corridors/buffers)
- Though Chattanooga has a larger land area and population base, it is economically similar to Mansfield:
    - Median Household Income: Chattanooga ($32,000)/ Mansfield ($30,176)
    - People under the Poverty Line: Chattanooga (17.9%)/ Mansfield (16%)
- Both Mansfield and Chattanooga have similar land-use zones/ordinances (Chattanooga does have more types of residential areas accounted for)
- Chattanooga has the advantage of water systems that attract certain type of business and establishments to the area
- Chattanooga currently has a vibrant downtown area that is the focal point for its greenways network; this is not necessarily the case in Mansfield

Potential Sites for Buffer/Corridor Development

There are three potential sites for urban buffer or corridor development in the city and they have been chosen for different reasons. The three sites are the following:

- Tract 6 (Residential)
- Tract 16/17 (both Mixed)
- Tract 8 (Mixed)

A portion of Tract 6 has been identified by the city of Mansfield as the "Civic Center Neighborhood", which is part of its latest redevelopment plans (and outlined in the consolidation plan). Located near downtown, the neighborhood was the focus of a previous revitalization project in 1985. The object was to create a new city civic center in the midst of existing structures (i.e., the Chamber of Commerce, the Mansfield News Journal, and Richland Carrousel Park), but as plans progressed and negotiations faltered between the project task force and potential property/home sellers, the project was abandoned. Unfortunately, many of the properties that were to be sold eventually became abandoned, vacated, and unmaintained by owners. Though good structures are present, there are a large number of older and run-down homes, unkempt vacant lots, and an under-utilized football field (primary green space in the neighborhood).

The current task force has found various different problems plaguing the area. First, as touched on above, the area is in a state of decline. As more tenants are leaving the area, the landlords and owners are finding it difficult and/or unnecessary to address repairs and upkeep of structures. It results in the remaining residents (sometimes the "poorest of the poor") having to contend with the deteriorated conditions. In addition, it discourages the purchases of homes from citizens receiving HUD vouchers from the state because the building/home conditions do not meet specified standards (i.e., free of lead-based paint). This proves detrimental since Tract 6 has the "highest percentage of households receiving HUD vouchers to assist with paying for their housing" in Richland county (14.3% used in Tract 6). Second, the area has been identified as

having predatory lending problems in the past. The biggest issues were predatory refinancing and rapid property transfers at inflated prices. Oftentimes predatory lending targets low-income and minority individuals, and in the case of Tract 6, 67.7% of the residents are considered low/moderate income and approximately 40% are African American. Lastly, there has been a lack of code and zone enforcement. The multiple-family (MF) and central business (CB) designations for the area have been defined broadly and allowed for establishments that have changed the atmosphere of the neighborhood.

Listed next are the demographics and trends for Tract 6:

- **Population**
    - Total: 4,515
        - Male: 2,163
        - Female: 2,352
        - White: 2,513
        - Black: 1,762
        - Native American: 24
        - Asian: 20
        - Hispanic: 63
        - Other: 31
        - Families: 1,042 (55.4%)
- **Housing**
    - Total Housing Units: 2,087
        - Occupied Units/Households: 1,712 (82.0%)
        - Vacant Units: 375 (18.0%)

- Occupancy
  - Owner-Occupied: 764 (44.6%)
  - Renter-Occupied: 948 (55.4%)
- 60.9% of homes classified as poor or worse condition
- 2.7% of homes classified as good
- Average Value of Housing Units: $21,000 (apprx. 100 years old)

- **Incidents and Frequency Reported % (as reported to the police)**
  - Drug: 427 (24.8%)
  - Juvenile: 464 (20.0%)
  - Persons: 3,295 (17.0%)
  - Property: 3,400 (14.8%)
  - Other: 1,535 (18.3%)

- **Trends (Tract 6 vs. city of Mansfield)**
  - Employment rate the same as city (93%)
  - Poverty rate higher than the city (29% vs. 16%)
  - Median income lower than the city ($29,000 vs. $38,000)
  - Vacancy increasing
  - Number of housing and families declining
  - Population declining

Next, Tract 16 and 17 are located on the north side of Mansfield and encompasses both residential areas and mixed commercial and industrial facilities (i.e., Mansfield Lahm Airport and two correctional facilities). These particular tracts were chosen because it was initially observed that some neighborhoods were located in close proximity to industrial complexes that

may potentially create air, water, and soil problems. An example is the neighborhoods located adjacent to AK Steel, a major employer in the city (the neighborhoods fall within Tract 16; AK Steel falls within Tract 17). The main barrier separating the homes and the facility is a two-lane road (Bowman Street) and the only enclosing structure is a wire fence. However, upon further observation, it was suggested that the greatest environmental impacts may be the unobscured view of the large facility and the noise related to production and accompanying transportation. Listed next are the demographic profiles and trends of both tracts:

Tract 16

- **Population**:
  - Total: 2,129
  - Male: 1,041
  - Female: 1,088
  - White: 1,921
  - Black: 165
  - Native American: 13
  - Asian: 1
  - Hispanic: 33
  - Other: 3
- **Incidents and Frequency Reported % (as reported to the police)**
  - Drug: 21 (1.2%)
  - Juvenile: 34 (1.5%)
  - Persons: 268 (1.4%)
  - Property: 356 (1.6%)

- Other: 145 (1.7%)

- **Trends (Tract 16 vs. city of Mansfield)**
  - Employment rate same as the city (93%)
  - Poverty rate lower than the city (11% vs. 16%)
  - Median income lower than the city ($31,000 vs. $38,000)
  - Owner occupancy higher than the city (81% vs. 59%)

Tract 17

- **Population**
  - Total: 4,991
  - Male: 4,792
  - Female: 199
  - White: 2,168
  - Black: 2,727
  - Native American: 18
  - Asian: 8
  - Hispanic: 57
  - Other: 51

- **Incidents and Frequency Reported % (as reported to the police)**
  - Drug: 4 (0.2%)
  - Juvenile: 0 (0.0%)
  - Persons: 221 (1.1%)
  - Property: 339 (1.7%)
  - Other: 159 (1.9%)

- **Trends (Tract 17 vs. city of Mansfield)**
    - Employment rate higher than the city (100% vs. 92%)
    - Poverty rate lower than the city (7% vs. 16%)
    - Median income higher than the city ($46,000 vs. $38,000)
    - Owner occupancy higher than the city (80% vs. 59%)

The final site is Tract 8, which is the location of the home of the resident interviewee. Tract 8 was chosen because as with Tracts 16 and 17, neighborhoods are in close proximity of industrial facilities, thus potentially increasing their risk of environmental impact. A main example is the issue discussed in the resident interview involving Breitinger Company. The company and the surrounding homes are separated by a side street (Vine Street) and there is no enclosing structure surrounding the property. Upon further observation (as with Tracts 16 and 17), it was suggested that the main environmental issues were unobscured views of the facility and noise related to production and accompanying transportation/traffic. Listed next are demographic profiles and trends of the tract:

- **Population**:
    - Total: 2,996
    - Male: 1,489
    - Female: 1,507
    - White: 2,398
    - Black: 466
    - Native American: 12
    - Asian: 17
    - Hispanic: 52

- Other: 24

- **Incidents and Frequency Reported % (as reported to the police)**
  - Drug: 94 (5.5%)
  - Juvenile: 147 (6.3%)
  - Persons: 1,277 (6.6%)
  - Property: 1,394 (6.1%)
  - Other: 514 (6.1%)

- **Trends (Tract 8 vs. city of Mansfield)**
  - Employment rate lower than the city (89% vs. 93%)
  - Poverty rate higher than the city (20% vs. 16%)
  - Median income lower than the city ($30,000 vs. $38,000)
  - Owner occupancy higher than the city (69% vs. 59%)

After observing the three sites and determining the extent of impacts, research was done on the implementation of noise barriers. Noise barriers typically constructed to control the impact of noise from industrial and commercial operations (i.e., airports, highways, and cooling towers) onto residential or non-industrial/commercial areas. When considering such barriers, two initial considerations should be made. First, the barrier structure must be acoustically adequate and second, non-acoustical issues must be addressed (i.e., unsafe conditions, visual blight, maintenance difficulties, etc) (Guidelines on Design of Noise Barriers). Noise barriers are usually categorized by four types:

- Reflective type (transparent or non-transparent)
- Absorptive type (sound absorbent materials with possible finishes of absorptive panels)

- Earth landscaped mound and retaining materials
- Mixed type (a combination of any of the above)

There are also common materials that are used to construct the structures. They are as follows:

- Steel (painted, galvanized, or stainless)
- Aluminum
- Polycarbonate or acrylic sheets
- Concrete
- Brick- or glass-fiber reinforced concrete (GRC)
- Proprietary-made acoustic panels
- Landscaped earth berm

While barrier controls the noise, it is important that the structure be aesthetically appealing to the area or neighborhood in which it is installed. The design should have appropriate scale and character (appealing colors, textures, or shapes) that is compatible with the local environment, as well as be a subordinate structure among the existing landscape. In neighborhoods and other residential areas, vegetated barriers are popular because it allows for plantings of flowers or other vegetation in that actual barrier design (Guidelines on Design of Noise Barriers). Commercial examples of noise barriers include Whisper Walls ® (rubber and concrete-aggregate wall designed to adsorb sound from highways, airports, railroads, and other industrial/commercial functions) and Lincoln Locks ® (a wall grid system that features interlocking walls that provide sound absorption and allow for vegetation growth) (Innovative Precast Concrete Systems).

Viability of Buffer/Corridor Development

(To be discussed in "Chapter 6: Analysis and Discussion")

Chapter 6: Analysis and Discussion

In reviewing the results, there are many different areas that will be analyzed. First, there is the structure of Mansfield in relation to the Burgess and Hoyt Models of urban cities and areas. In comparison to the Burgess Model, Mansfield does have a central business district that serves as the core of the city (the downtown area, also identified as Tract 1). The core region is surrounded by light industrial and manufacturing areas and older, low-to-middle income residential neighborhoods (such as Tracts 2, 3, 4, 5, 6, 7, and 8), which corresponds to Zone 2: Inner City or Twilight Zone and Zone 3: Low Class Residential of the model. As one moves even further out, the areas and neighborhoods become more residential with lower percentages of homes considered poor/lower condition and there are lower housing ages (such as Tracts 9, 10, 13, and 14), which again corresponds to Zone 4: Medium Class Residential and Zone 5: High Class Residential.

In comparison to the Hoyt Model, there are also strong similarities. As in the Burgess Model, there is a core central business district surrounded by industrial and commercial facilities and older, lower-to-middle income neighborhoods (in the Hoyt Model, Section 2: Wholesale Light Manufacturing and Section 3: Lower-Class Residential). Again, the pattern moves to neighborhoods considered more residential with lower instances of poor conditions and aging homes (in the model, Section 4: Middle-Class Residential). Mansfield does have a section where heavy industrial operations occur (Tract 17) that corresponds to Section 6: Heavy Manufacturing, and higher established residential areas that correspond to Section 5: High-Class

Residential. However, Mansfield does not have a business district that extends outside of the CBD (as with Section 7: Outlying Business District). Section 8: Residential Suburb would include the surrounding cities of Lexington, Bellville, and Madison, and Section 9: Industrial Suburb would include the city of Ontario (location of the county's largest employer, General Motors, as well as the county's mall and newly built stores and restaurants).

Based upon these models, Mansfield does fit the trend of expansion moving from the original industrial sites of the city (as well as some of the original homes and buildings built). Many of the oldest sites have been abandoned or converted into other uses as more businesses become established within others in and around the city. There were two explanations given by the Hoyt Model as to the structure of urban cities, which have mixed results in relation to Mansfield. The Hoyt Model contends that central business districts usually become more expensive, thus encouraging businesses to move outward. While the property located in downtown Mansfield may have increased over the years, the issue of property value and associated costs may not be the reason for business and economic decline. With the closing and relocation of many of the businesses and industrial facilities (i.e., steel mills and automotive manufacturing sites), the attractiveness and lucrative feasibility of setting up establishments in the downtown area diminished. Hence, the CBD is currently home to many vacant and abandoned structures.

This helps affirm the second explanation given by the Hoyt Model, being that industries move to a "concentration of similar land uses". As businesses and industries moved farther away from the CBD of Mansfield, they located in outlying cities and townships where economic development is flourishing. As mentioned earlier, the suburb of Ontario has General Motors, other manufacturing facilities, and a large influx of national-chain restaurants and stores (i.e.,

Wal-Mart, Target, Barnes and Nobles, Starbucks, Olive Garden, and Red Lobster). Within the past couple of decades, the dynamics of Mansfield has changed with the movement of industries and the population. Many residents are moved to the surrounding communities for the jobs, higher-rated school districts, and the opportunity to acquire land at reasonable values. The result has been an economic decline for the city of Mansfield, which touches on the next analysis of dereliction.

Many of the neighborhoods and older industrial areas are facing dereliction due to economic uncertainty and shifting population trends. The city is facing both the physical and functional obsolescence that operated under dereliction. The physical obsolescence is characterized by Mansfield's deserted industrial sites, the aging housing stock of many neighborhoods, the poor or non-existent maintenance of some homes and buildings, and limited funding available by the city. Functional obsolescence is coming from the appeal of opportunities coming from the surrounding cities (as mentioned before, larger employers, malls, stores, good school districts, and home construction). What are left are the remaining citizens who have to contend with higher taxes and levies to compensate for the declining neighborhoods and businesses. Oftentimes, the residents are have low/moderate income (the LMI tract average is 51.28%) and in many cases (evident by the tract statistics) predominantly minority.

The next analysis deals with the environmental impacts within Mansfield. Though the city is urban in structure and primarily industrialized, it has not faced many incidents of environmental degradation. Many of the blighted neighborhoods and older structures will have to address issues of lead-paint, asbestos, and the possible deterioration or leakage of underground fuel tanks, but many of the public and private projects dealing with these matters have been postponed due to large costs associated with testing, monitoring, notification, abatement,

disposal, and other practices (this may, however, have an effect on the resident's health and safety). There may be issues of mass impact (i.e., exposure risks) once remediation occurs, but overall, the city does not face major environmental impacts from industrial operations.

While many air, water, and soil related environmental impacts (i.e., pollutant plumes and discharges) do not affect residential areas, there does seem to be an issue with noise and aesthetics associated with some adjacent industrial facilities. This was witnessed in two of the three sites identified for potential implementation of urban corridors or buffers. Both Tract 16/17 and Tract 8 had industrial facilities located in very close proximity to homes, all which were in direct view of the operations and accompanying transportation and traffic. According to the resident interview in Tract 8, the plaintiff experienced continuous vibrations and noise from the stamping operations with the Breitinger Company (as well as increased truck traffic). Given the similarities of the location of AK Steel in Tract 17 and the Breitinger Company in Tract 8 to their adjacent residential neighborhoods, it was assumed that residents in Tract 16 experienced the same nuisances.

The next analysis is the opportunity for urban corridors of buffers to be implemented within the city of Mansfield. Mansfield has various different existing green spaces (i.e., regional bike trail and parks) and vacant sites that lend the space for possible corridors/buffers, but the feasibility is low. There are various abandoned rail-lines that could be useful as a habitat or vegetation corridor, but many are located in existing industrial and manufacturing areas (i.e., Tract 17), which limits pedestrian accessibility (plus, it would not benefit any neighborhoods due to the industrial and manufacturing zoning). As mentioned earlier, there are no to few environmental impacts affecting residential neighborhoods adjacent to or near industrial facilities that would cause concern for environmental discharges, spills, or other related physical incidents.

However, consideration should be made by key stakeholders to construct some type of noise barrier (which can also serve as an aesthetic diversion). The legal action taken by the resident in Tract 8 may have an impact on the zoning practices of the city and influence officials, business owners, and developers to consider and plan for noise impacts/barriers in future developments.

Chapter 7: Conclusions

Listed below are the initial questions posed in section 1.2 and outcome and summary of each:

- What environmental conditions affect cities/urban areas?

  Urban areas may have to contend with poor air quality (which can include health implications from garbage incineration, industrial emissions, and automobile exhaust), water issues (contaminated water supplies, acid rain, and contaminated runoff), soil contamination and land destruction (soil erosion, land clearance, land for disposal, and lost of land supporting various habitats and biodiversity), and waste issues (disposal-caused resource depletion, sewage and water disposal, and generation of garbage and other waste)

- What are the criteria for a reasonable (or minimal) environmental buffer between industrial and residential uses in cities/urban areas?

  What is essentially needed is available land and/or space (which must consider unique, continuous, and/or gapped landscapes), reasonable distance between existing structures, definitive ownership, and planned cost-effectiveness (feasible for the purposes and audience it will serve). It should be noted that the listed outcomes (as well as those for some of the remaining questions) are based on the guidelines for implementing

greenway networks and other similar projects. This is because information or data is limited on buffers, except for those projects that have already been attempted or constructed (i.e., Chattanooga greenway networks)

What are the practices or uses within industrial and residential areas that pose environmental problems?

Practices include mismanagement of input and/or output products (which includes the disposal, storage, and utilization of various oils, coolants, paints, household items and other products), noise associated with production operations, lack of security and accessibility (to contain the products and practices on the industrial site, to limit outside accessibility of citizens on industrial sites, and to protect citizens overall from incorrect practices, both industrially and residentially)

What land uses are most acceptable for industrial buffers?

- How might the establishment of industrial buffers impact the economic viability of the area and its surroundings?
- What other impacts will the industrial buffers have:
  - On transportation?
  - On the environment? (is there potential for creating a new nuisance to the environment?)

Any land use is acceptable for the implementation of a corridor or buffer as long as the available land or space provides for the intended purposes (habitat corridor, absorption of runoff, replenishment of air, recreation, and/or alternative transportation routes). As an example, the greenway networks in Chattanooga utilized various different land use zones (i.e., residential, industrial, commercial, etc) to complete the project. Abundant planning

between the city government, existing facility and home owners, and potential developers will be needed to ensure that the corridor or buffer construction is compatible with the rest of the landscape. There is potential for economic growth and viability because some corridors or buffers attract businesses, which could be benefited by the communities and the city. An example is the growth of Chattanooga's downtown area and riverside establishments in conjunction with the advancement of the city's greenway networks. There is, however, the possibility of changing the character of the particular community with the introduction of new businesses and clientele. This leads to the impact on transportation and the surrounding environment. Given the purpose of the corridor or buffer, the outcome on transportation could be two-fold. The buffer could re-route transportation and traffic to provide minimized impact to adjacent residential areas. However, if the corridor or buffer has the added benefit of recreational uses or generates the establishment of new businesses, there is the potential for transportation (that not directly linked to industrial purposes) to increase. The same holds true for impacts on the environment. While the implementation of the corridor or buffer may ease some industrial impacts on neighboring residents, the construction may alter the already existing environment or create a new nuisance (i.e., misplacement and storage of soil, groundwater contamination, and runoff from construction practices).

<u>How can this be implemented in model site (Mansfield, Ohio)?</u>

- Where are there opportunities?
- What are the obstacles?

Opportunities lie in Mansfield in that there are residential zones that are in close proximity to industrial facilities and could be affected by any environmental impacts

released. The obstacle is that the city those not face many significant environmental impacts, as well as land or space availability is limited between the two areas, so the feasibility of implementing a corridor or buffer is challenging

The research and results conducted has brought about enlightening conclusions about the implementation of urban corridors and buffers in residential and industrial zones.

Many urban areas are facing serious issues of economic instability and dereliction due to the absence or relocation of vital businesses and industries and the shifting movement of residents out of the city. The result is less-vibrant downtown districts, poor and aging neighborhoods, and mental anguish suffered by remaining citizens.

Within these cities, various zones have been established to accommodate industrial and manufacturing processes, commercial uses, and residential needs. While differing zones may pose conflicts for one another, the initial idea presented in the beginning chapters that industrial zones pose environmental threats to neighboring residential zones does not occur in every urban city or area. An industrial facility located near or within a residential zone does not mean environmental impacts will automatically be generated. This does not suggest that the facility's practices or processes pose no environmental risks, but it does suggest that the surrounding residences will not always be dramatically affected. What was not initially considered in the beginning chapters was the impact of other environmental issues generated by the industrial facilities, specific examples being noise and other acoustical problems. These occurrences can be just as damaging as environmental impacts (i.e., oil spills or toxic fumes) affecting air and water quality and the condition of surrounding soils.

In the event that an urban corridor or buffer is needed to ease environmental impacts between residential and industrial zones, the planning and development of the easement must fit

the needs and structure of the city in which it will be constructed. What may be successful in one city does not automatically transcend to success in another area. The corridor, buffer, or green space should be designed to benefit the citizens and areas it was intended for. As an example, it was researched that the city of Chattanooga improved its environmental conditions by developing interlinking greenway trails and sites that was useful for both pedestrian and automotive uses. However, it was discovered that implementing the same type of establishments in the case study city of Mansfield was not feasible. Each city posed different land structures and needs that called for unique projects.

This leads to the viability of implementing urban corridors or buffers in the city of Mansfield. The initial suggestion was that given its urban structure and strong industrial presence, the city of Mansfield as a whole would benefit from the implementation of corridors and buffers. However, the data and results concluded that the feasibility and need for implementing such structures (including noise barriers) is low. There were examples of conflict between some residential and industrial zones, but the overall affect of industrial practices have not posed a significant risk for environmental impacts against adjacent or near-by residential areas. Interestingly, what was discovered (but not initially considered) was the potential for noise impacts to the adjacent neighborhoods due to the facility's production processes and accompanying traffic. These types of environmental impacts may be combated by the implementation of noise barriers, which would have to be discussed and determined by key stakeholders and other interested parties on a case-by-case basis.

The lessons that have been learned are abundant. There are so many dynamics and factors that have to be considered when analyzing the conditions of urban areas and there is no "one size fits all" model, template, or explanation for any of them. Urban cities definitely need to address

social and environmental problems they are facing and it will take the cooperation of city officials, business owners, developers, public and private interest groups, and most importantly, the citizens to get the results needed to keep these cities alive and productive. Though the initial proposal did not conclude to be very feasible for the case study city, the implementation of corridors or buffers may be more beneficial for needs in another location. Other urban areas or municipalities have the opportunity to evaluate their city and determine if any environmental conditions exist, if they would benefit (either economically or socially) from the addressing of these environmental conditions, and if the implementation of a corridor or buffer would be feasible. What should be learned by other urban areas is that addressing the environmental concerns or eradicating the environmental impacts faced by its citizens could lead to both a physical and psychological revitalization extending beyond the construction of a corridor or buffer. Interest in the citizen's environment and investment into the betterment of that environment encourages more growth and more power (for both the city and residents). Thorough investigation and planning will be key to ensure if such structures are needed to address environmental impacts in any land-use or zone.

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Appendix A: Interview Questions (Template) Submitted to and Answered by the City of Mansfield Fair Housing Commission

1. Fair Housing Commission

Name: _____

Title: _____

Office/Dept.: _____

Date: _____

a. What is the function of your job and/or department?

b. What are the general issues or concerns that are addressed (provide examples)?

c. Has there been a problem or issue with residential neighborhoods becoming classified as "blighted", and if so, what were the precursors or root causes?

d. Do the abovementioned areas (or any others) face any environmental impacts or problems?

e. Have there been problems with adjoining residential and industrial-zoned areas, and if so, what were they?

f. Have there been environmentally-related concerns raised by residents living in close proximity to industrially-zoned areas, and if so, what were they?

Appendix B: Interview Questions (Template) Submitted to and Responded by the City of Mansfield Economic Development Director

2. Economic Development Director

Name: _____

Title: _____

Office/Dept.: _____

Date: _____

g. What is the function of your job and/or department?

h. What are the steps or processes for promoting (and finally going through with) development/revitalization in the city?

i. Who or what determines where development or revitalization takes place?

j. Does zoning impact where redevelopment or revitalization takes place, and if yes, what are the conditions?

k. Is the public involved or do they have the opportunity to provide comment?

l. Are environmental issues or concerns considered in relation to economic development or revitalization?

m. Have ideas been generated that are economically encouraging, as well as environmentally supportive (i.e., green spaces, parks, walking trails, etc)?

Appendix C: Interview Questions (Template) Submitted to and Responded by the City of Mansfield Building and Codes Department

3. Building and Codes Department

Name: _____

Title: _____

Office/Dept.: _____

Date: _____

n. What is the function of your job and/or department?

o. What are the types of zones designated within the city?

p. How is zoning determined or planned within the city?

q. Can zoning be changed, and if so, how?

r. Do zoning proposals have public hearings or are they open to public comment?

s. Is there public access to documentation identifying zones within the city?

t. Has there been an issue with conflicting or incompatible zones (i.e., industrial facilities adjacent to residential neighborhoods)?

u. Do you consider or address problems with environmental impacts that may be associated with or result from designated zones?

Appendix D: Summary of Resident Interview

Resident Interview (4/20/2004)

1) Interviewee: Torri Staples
2) Date: 4/20/2005
3) Location: 545 Oakenwaldt (Mansfield, OH)
4) Issue: Environmental impacts from adjacent industrial facility (Breitinger Company)

Torri Staples is the daughter of the resident currently residing at 545 Oakenwaldt. The resident (which will be referenced as "plaintiff") is currently pursuing legal action against the Breitinger Company (595 Oakenwaldt), a factory located adjacent to the plaintiff's property. The general claim is in regards to the environmental damage incurred from the factory.

During the mid-1980s, the small family-owned factory was constructed in the residential neighborhood (low/moderate income and predominantly ethnic minority characterization) for the function of producing and packaging automotive and other parts. There was a notice submitted to then-existing neighbors that the facility would be built, but no other public notification can be recalled. The factory is currently located a few feet from the plaintiff's main residence (the plaintiff owns two homes in the neighborhood).

Within the last seven years, larger facility space has been added to the original factory (which includes the construction of two parking lots and the addition of stamping operations). The increased production has resulted in greater truck traffic and related impacts (i.e., wheel tracks, spilled hydraulic fluid, parked trucks, etc), as well as unpleasant industrial impacts (i.e., burning, odors, noise, vibrations, etc). The plaintiff is citing physical (i.e., lack of sleep, constant vibrations, damaged property, etc) and mental stress from the operations taking place.

The plaintiff has notified and complained to both the company and City of Mansfield mayor's office, but no satisfactory results have come about. The plaintiff has obtained an attorney and is in the midst of pursuing legal action against the company. Currently, the situation as stated by the plaintiff has not altered.

Breitinger Company
595 Oakenwaldt Ave (Mansfield, OH)
(419) 526-4255
http://www.breitingercompany.com/

- Located within Tract 8 of the Mansfield Consolidation Plan
- Various types of focus areas: stamping/assembly, design/engineering, machine shop/tool & die, and metal fabrication/material handling
- Quality standards: ISO 9002
- Additional value-added services: tube bending, expanding, assembly, flanging, flaring, buffing, piercing, swedging, and deburring